the whole course of treatment. Neighboring healthy skin should be well protected with heavy leaden masks. The advantage of excising or scraping diseased tissue prior to the use of the x-rays is dwelt upon. The open wound usually heals by granulation in from four to eight weeks, the scar comparing favorably with that of cases healed exclusively under the rays.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

WARFIELD T. LONGCOPE, M.D.,

DIRECTOR OF AYER CLINICAL LABORATORY, PENNSYLVANIA HOSPITAL,

ASSISTED BY

G. CANBY ROBINSON, M.D.,

RESIDENT PATHOLOGIST, PENNSYLVANIA HOSPITAL, PHILADELPHIA.

A Study of the Bacteriology of Pertussis.—M. WOLLSTEIN (*Journal of Experimental Medicine*, 1905, vol. vii. p. 335) presents the results of a bacteriological study of 30 cases of pertussis, with special reference to the agglutination reactions of the patient's blood. She isolated from the sputum of 29 of the cases an organism which resembled the influenza bacillus. It grew only on hæmoglobin-containing media and was morphologically like the influenza bacillus, except that it was somewhat larger. This organism appears to be the same as that isolated by Spengler and later by Jockmann and Krause, who called it bacillus pertussis, Eppendorf.

The blood of the patients from whom the bacillus was obtained agglutinated in all cases the organism in 1: 200 and sometimes in 1: 500 dilutions. Homologous serum always produced the highest and most complete reactions, but serum from pertussis cases reacted on all strains of the bacillus in as high dilutions as 1: 100. Various control experiments with normal sera were negative.

By immunizing rabbits with the organism and with influenza bacilli, it was found by absorption experiments that each organism produced a group agglutinin affecting the other, but that a small amount of agglutinin specific for the bacillus from the cases of pertussis was also produced by that organism.

The Action of Roentgen Rays on the Blood.—LINSER and HELBER (*Deutsche Arch. f. klin. Med.*, 1905, Bd. lxxxiii. p. 479) find that the x-ray in its destructive effect upon the blood has an election for the white blood cells. This is particularly true of its action upon the circulating blood. Of the different forms of white blood cells the lymphocytes are least resistant to the action of the rays. Through the destruction of the white blood cells in the circulating blood, as well as in leukocyte-containing fluids without the body, there is formed in the serum a leukotoxin. The injection of such serum into other animals produces a marked fall in the numbers of leukocytes in the circulating blood.

The quality of this leukotoxin stands in direct relation to the numbers of leukocytes destroyed by the action of the x-ray. The substance is inactivated by heating to 55° to 60° C. It is transmitted from the mother through the placenta to fœtus. After treatment of the animals by the Roentgen rays a nephritis appears, which is not dependent upon the direct action of the rays upon the kidneys. The x-ray has little effect upon the blood platelets, red blood cells, and hæmoglobin content. The coagulation of the blood suffers no change through the extensive destruction of leukocytes. Radium and ultra-violet rays produce no changes comparable to those described.

Iodine as a Disinfectant.—Using as test objects bacillus prodigiosus, bacillus anthracis, and spores, bacillus tuberculosis, staphylococcus pyogenes aureus, streptococcus pyogenes, blastomyces dermatidis, and actinomyces bovis, DR. GUY C. KINNAMAN (*Journal of the American Medical Association*, August 26 and September 2, 1905) conducted an extensive series of experiments on the germicidal action of iodine, which led to the conclusion that in solutions of from 0.2 to 1 per cent. it is far superior to corrosive sublimate, 1: 1000, which failed to destroy streptococci in fifteen minutes, while iodine 0.2 : 1000 killed them in two minutes. Iodine solutions are easily prepared and are stable. Iodine neither coagulates albumin nor forms inert compounds with tissues; it is rapid in action; it possesses remarkable penetrating power, and in effective strength it is non-toxic and non-irritating. For all practical purposes a solution of 0.5 per cent. strength is sufficiently strong.

The Morphology of Cells of Exudates and the Specificity of the White Blood Cells.—HELLY (*Ziegler's Beiträge*, 1905, Band xxxvii. p. 171) has made an extensive study of the cells of inflammatory exudates, using both smear preparations and sections for the examination of the exudates, which were produced principally by the injection of several varieties of bacteria into the tissues and serous cavities of animals. He concludes that under the influence of bacterial irritants several different types of cells make their appearance in the tissues during the first twenty-four hours. These cells are derivatives of the hæmopœtic system, among which the adventitial cells (so-called leukocytoid cells and polyblasts), which are identical with the white blood cells of the circulating blood are to be counted. They may be divided into two groups: granular polymorphonuclear leukocytes, and basophilic uninuclear lymphocytes. These groups may again be subdivided, the first into amphophile and eosinophile leukocytes, including myelocytes; the second into small and large lymphocytes, with swollen forms of the last variety. Each one of these cell types bears a peculiar relation to the infection. The changes which are to be noted in these cells are both functional and degenerative. The functional changes in the amphophile leukocytes consist in their phagocytic action toward small foreign bodies and bacteria, while the lymphocytes show active phagocytosis for the leukocytes and other cells, as well as for foreign bodies, strictly exclusive of the bacteria. The degenerative changes in the amphophile leukocyte consist in vacuolization, enlargement, disappearance of the granules, swelling and fragmentation of the nucleus or piknosis after the disappearance of the granules. The granules either undergo dissolution within the cell or are extended from the protoplasm. Com-